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Indian Standard
SPECIFICATION FOR
RUBBER ICE BAGS

(First Reprint MARCH 1989)

UDC 615.832.94:678.4.06

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BUREAU OF INDIAN STANDARDS
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Indian Standard

SPECIFICATION FOR RUBBER ICE BAGS

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Indian Standard

SPECIFICATION FOR RUBBER ICE BAGS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 5 August 1966, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 Rubber ice bags are manufactured by moulding and press curing in the country, though these are occasionally hand-made from cut sheets of rubber, elsewhere. These bags are commonly manufactured in round shape and red colour. Of late, oval shape ice bags are also finding their way into the market which may become popular since these are generally applied on the forehead. This standard covers both the types of ice bags.

0.3 Apart from the test for reaction to aqueous extract, there are no other requirements prescribed in this standard preventing the use of such ingredients in compounding of rubber which may cause irritation, chafing or contact dermatitis to the skin coming in contact due to the obvious difficulties in either prescribing the composition of rubber or prescribing detailed chemical or physiological tests. It is however recommended that only ingredients, free from harmful substances liable to cause irritation, chafing or contact dermatitis, be used in the manufacture of ice bags.

0.4 In the preparation of this standard, considerable assistance has been derived from the following publications:

T-47-121-1946 Caoutchouc Vessies à glace moulées (Rubber ice bags). Association Française de Normalization.

B.S. 1898:1952 Specification for rubber ice bags for the hospital use. British Standards Institution.

ZZ-B-0045 a-1963 Bag, ice, rubber. US Federal Supply Services.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated,

expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and tests for ice bags made from natural rubber or synthetic rubber, or a blend of the two.

2. TYPES

2.1 This specification covers two types of ice bags according to their shape and size, as follows:

Type A Round shape.

Type B Oval shape.

3. REQUIREMENTS

3.1 No compounding ingredient shall be included which may be injurious or cause irritation to living human skin coming in contact with the finished bag.

3.2 The bags shall be round for type A and oval for type B with an opening in the centre for the closure and cap. The ice bags shall have smooth surfaces and all joints shall be made before vulcanization except the closure which may be fitted after vulcanization. The closures and caps shall be of non-rusting type. The closures shall have a groove on the outside, around its circumference. It shall be tightly and securely fixed to the mouth of the bag by two or more turns of galvanized mild steel wire, 0.45 to 0.47 mm, placed in line with groove. A layer of rubber-proofed fabric shall be placed between the rubber and wire and the whole neck shall finally be covered by a rubber sleeve. The rubberized fabric and rubber sleeve shall be fixed using rubber solution and shall be of such size as to extend, throughout the height of the neck, up to the rim of the closure. The form and pitch of the screw threads on the cap and in the closure shall be such that the cap shall screw accurately along the whole length of the closure threads. The cap shall be fitted with a suitable rubber washer. When the cap is screwed home, the flange of the cap shall press closely on to the rubber washer and provide a water-tight closure. The rubber of the sleeve and washer shall be of the same quality as that used in the body of the bag.

*Rules for rounding off numerical values (*revised*).

3.3 Colour — The colour shall be as agreed to between the purchaser and the supplier.

NOTE — For the sake of uniformity reddish pink colour which is generally associated with the ice bags used in hospitals, is recommended.

3.4 Dimensions

3.4.1 The type 1 material shall have a diameter of 200 ± 6 mm and closure opening of 50.0 ± 0.5 mm (nominal). The minimum thickness (7.1) of rubber of the body shall be 0.6 mm.

3.4.2 The type 2 material shall be oval in shape, shall have the external diameter along the major axis as 340 ± 5 mm and minor axis as 185 ± 3 mm and closure opening of 50.0 ± 0.5 mm (nominal). The minimum thickness (7.1) of rubber of the body shall be 0.6 mm.

3.4.2.1 A recommended shape and size for type 2 is given in Fig. 1.

3.4.3 The thickness (7.1) of rubber washer and wall thickness of rubber sleeve shall be 1.5 to 2 mm.

3.5 Physical Properties of Rubber

3.5.1 Tensile Strength and Elongation at Break Before and After Ageing — Unaged and aged values of the rubber for tensile strength and elongation at break, shall not be less than those specified in Table 1.

TABLE 1 REQUIREMENTS FOR PHYSICAL PROPERTIES OF RUBBER

Sl No.	CHARACTERISTIC	ORIGINAL VALUE BEFORE AGEING	PERMISSIBLE DEVIATION FROM ORIGINAL VALUE AFTER AGEING
(1)	(2)	(3)	(4)
i)	Tensile strength, <i>Min</i>	140 kg/cm ²	- 20 percent
ii)	Elongation at break, <i>Min</i>	500 percent	- 20 percent
iii)	Tension set, <i>Max</i>	10 percent	+ 0 percent
			10 percent

3.6 The aqueous extract of the material when tested according to the method prescribed in 7.5 shall be neither acidic to methyl orange nor alkaline to phenolphthalein.

3.7 Leakage — The bag shall be leakproof when tested according to the method prescribed in 7.6.

3.8 Workmanship — The surface shall be free from pits and other imperfections which may affect serviceability or appearance of the bags.

testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. PACKING

5.1 The material may be packed in polyethylene bags or as agreed to between the purchaser and the supplier.

6. SAMPLING

6.1 For the purpose of ascertaining the conformity of the rubber ice bags in a consignment to this specification, the scale of sampling and criteria for conformity shall be as prescribed in Appendix A.

7. TEST METHODS

7.1 The thickness of the rubber shall be measured with a thickness gauge reading to 0.05 mm or less, the foot of which shall exert a pressure of 200 g/cm² on the rubber.

7.2 **Tensile Strength and Elongation Test** — The material shall be tested in accordance with the method prescribed in IS : 3400 (Part I)-1965*.

7.3 **Ageing Test** — The material shall be tested in accordance with the method prescribed in IS : 3400 (Part IV)-1965†, at the ageing temperature of 70° ± 2°C for 168 h.

7.4 Tension Set

7.4.1 *Apparatus* — Any suitable apparatus capable of subjecting test pieces to constant elongation, may be used. Care is needed to ensure that the test piece does not creep out of the grips, slowly.

7.4.2 *Temperature of Test* — The test shall be carried out at 27° ± 2°C.

7.4.3 *Procedure* — Stamp reference marks 50 mm apart on a parallel-sided test piece 6 mm wide, cut from the sample. Fix it in the apparatus and stretch it so that the distance between the gauge marks is 250 mm. Hold the test piece in this position for ten minutes and release. Allow it to lie on a smooth flat surface for ten minutes and then measure the distance between the reference lines. Note the increase in this distance and calculate as percentage of the original length.

*Methods of test for vulcanized rubbers, Part I Tensile stress-strain properties.

†Methods of test for vulcanized rubbers, Part IV Accelerated ageing.

7.5 Reaction to Aqueous Extract — Cut out from each of the sample bags, selected at random for physical tests (col 6 of Table 2), a portion approximately equal to 10 g. From each test portion cut small pieces, 3 mm². Put them into a chemically resistant glass flask, and add 300 ml of distilled water (*see* IS : 1070-1960*). Fit the flask with a water cooled reflux condenser with ground glass connections and heat the distilled water to boiling point and continue boiling for half an hour. Detach the flask from the condenser and cover immediately to prevent any possible contamination. Cool the contents to room temperature.

7.5.1 To one portion of aqueous extract in 7.5 add 2 drops of methyl orange indicator (*see* IS : 2263-1962†). To another portion add one drop of phenolphthaleine solution (*see* IS : 2263-1962†).

7.6 Leakage Test — Fill the bag up to the neck with water. Screw the cap tightly in position and keep the bag with its contents suspended from its neck at room temperature for 2 hours. There shall be no sign of leakage or porosity during this period. After this, place the bag upside down horizontally for one hour at room temperature over a suitable plate or board of a size larger than that of the bag and having a flat surface, except for a hole or depression for accommodating the protruding neck of the bag and cap. There shall be no sign of leakage from any part of the bag body or closure during this period.

A P P E N D I X A

(*Clause 6.1*)

SAMPLING PLAN FOR RUBBER ICE BAGS

A-1. SCALE OF SAMPLING

A-1.1 Lot — All the ice bags of one type produced from the same mix of raw materials and processed exactly under identical conditions shall be grouped to constitute a lot.

A-1.2 Each lot shall be examined separately for judging conformity to the requirements of this specification. For this purpose a number of ice bags shall be selected at random from the lot. The number of bags to be selected shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

*Specification for water, distilled quality (*revised*).

†Methods of preparation of indicator solutions for volumetric analysis.

TABLE 2 SCALE OF SAMPLING

(Clause A-1.2)

No. of ICE BAGS IN THE LOT	No. of ICE BAGS TO BE SELECTED	PERMISSIBLE No. OF DEFECTIVES IN RESPECT OF CLAUSES OTHER THAN 3.5, 3.6 AND 3.7	No. of ICE BAGS TO BE TESTED FOR 3.7	PERMISSIBLE No. OF DEFECTIVES WITH RESPECT TO 3.7	No. of ICE BAGS TO BE TESTED FOR 3.5 AND 3.6
(1)	(2)	(3)	(4)	(5)	(6)
2 to 5	all	0	2	0	1
6 " 15	5	0	3	0	1
16 " 25	8	0	5	0	1
26 " 50	13	0	8	0	2
51 " 100	20	1	13	0	2
101 " 300	32	2	20	0	2
301 " 1 000	50	3	32	0	3
1 001 and above	80	5	50	1	5

A-1.3 The ice bags shall be selected at random in accordance with col 1 and 2 of Table 2. In order to ensure randomness of selection, use shall be made of random number tables. In case random number tables are not readily available, the following procedure may be adopted:

Starting from any ice bag in the lot count them in one order as 1, 2, 3, up to r and so on. Where r is the integral part of N/n , N being the number of ice bags in the lot and n the number of ice bags to be selected. Every r th ice bag thus counted shall be withdrawn to constitute the sample.

A-2. NUMBER OF TESTS AND CRITERION FOR CONFORMITY

A-2.1 All the ice bags selected in A-1.2 and A-1.3 in accordance with columns 1 and 2 of Table 2 shall be examined for all the requirements of this specification except those specified in 3.5, 3.6 and 3.7. Any ice bag failing in one or more of the requirements shall be considered as a defective. The lot shall be deemed satisfactory in respect of these requirements if the number of defectives does not exceed the corresponding number given in col 3 of Table 2. Only the satisfactory lot shall be passed on for leakage test according to 3.7 and 7.6.

A-2.2 The lot having been found satisfactory in A-2.1 shall next be tested for leakage according to 7.6. The number of ice bags to be tested shall be in accordance with column 4 of Table 2 and shall be taken at

random from those already selected. If the number of ice bags failing the test does not exceed the corresponding number specified in column 5 of Table 2, the lot shall be considered satisfactory in respect of this requirement and shall be passed on for further tests according to 3.5 and 3.6.

A-2.3 If the lot has been found satisfactory in respect of leakage also then it will be subjected to the tests for requirements given in 3.5 and 3.6. The number to be tested for the purpose shall be in accordance with column 6 of Table 2 and shall be taken at random from those already selected. The lot shall be considered to have met the requirements of this specification if none of the ice bag fails in the requirements of 3.5 and 3.6.

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